TTCP Awards

Template and examples for authors

Do not modify fonts etc in following slides

Title

Group, Panel / AG, and Panel/AG name

high resolution images/graphics

Program Name:

Objective:

Payoff:

Participants:

DSTO DRDC DTA DSTL NRL & SPAWAR

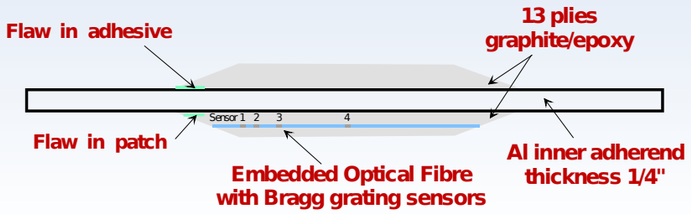
Future Activities:

Citation Text

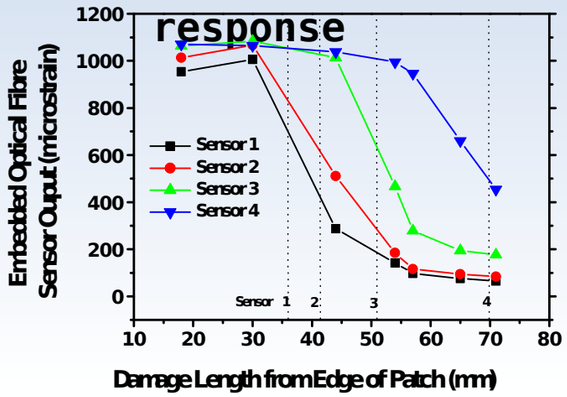
Embedded Sensors for Composite Bonded Repair Patches

MAT TP-7 Composite Technology and Performance

Generic specimen

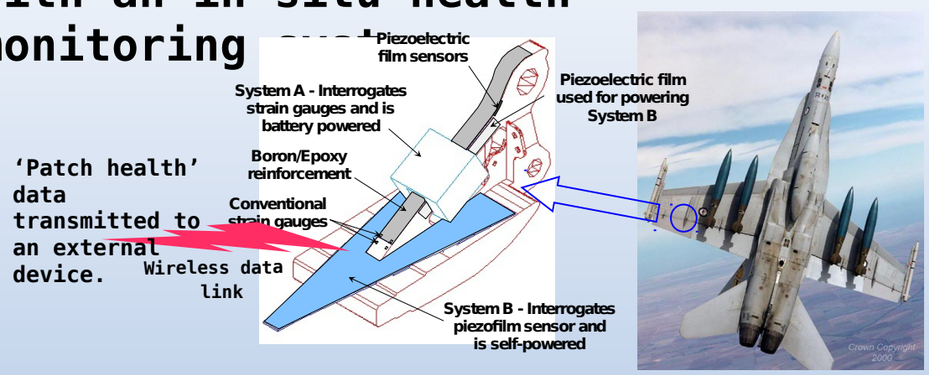

Flaw in adhesive
13 plies graphite/epoxy
Sensor 1 2 3 4
Flaw in patch
Al inner adherend thickness 1/4"
Embedded Optical Fibre with Bragg grating sensors

Embedded sensor response



Objectives: To evaluate the effectiveness of sensors embedded within composite bonded repair patches to measure the progression of damage within the repair. Develop a generic specimen and share assets available to each of the participating nations in their complementary investigations.

Illustration showing the F/A-18 flight demonstrator of a patch with an in situ health monitoring


Piezoelectric film sensors
System A - Interrogates strain gauges and is battery powered
Piezoelectric film used for powering System B
Boron/Epoxy reinforcement
Conventional strain gauges
'Patch health' data transmitted to an external device.
Wireless data link
System B - Interrogates piezofilm sensor and is self-powered

Payoff: Study showed the feasibility of using embedded sensors for in situ health monitoring of composite bonded repair systems. Assisted in the development of an in situ health monitoring system to be trialed on an aircraft and a maritime platform.

Participants:

DSTO NRC

DSTL / QinetiQ

The award is made for significant contributions to collaborative research on embedded sensors in bonded repair patches for aircraft structures. With such sensors, the repair can sense its own state of health. The outcome of this work is an innovative "Smart Repair" system, which will enable military aircraft to fly safely at much lower cost than would be possible using conventional maintenance procedures.

Radar Detection of Submarine Periscopes

SEN TP-6, Radar Detection of Small Targets in Clutter

Program Name: Periscope Detection False Alarm Control.

Objective: To improve radar performance by better understanding of sea clutter and detection algorithms.

Payoff: Participation allowed the member nations to share and jointly analyse high-resolution sea clutter and state-of-the-art periscope data. Novel coherent detection techniques were shown to improve significantly periscope detection false alarm rates. Results are applicable through software upgrades to several air and sea platforms and has already been applied to operational systems.

Participants:

DSTO DRDC DSTL NRL & SPAWAR

Future Activities: The detection techniques will be applied to fast inshore attack craft.

This award is made for a significant contribution to the joint characterisation of non-Gaussian or 'spiky' sea clutter and to the detection of periscopes in sea clutter. The ability to understand sea clutter and to detect periscopes is vital as the radar cross-section of periscopes becomes smaller and periscope exposures become briefer. As radar resolution is increased the sea clutter becomes non-Gaussian and target like. Each nation contributed to a comprehensive study that increased the understanding of this spiky sea clutter. Also each nation applied their own periscope detection techniques to a shared set of coherent periscope and clutter data making it possible to gain an appreciation of each other's algorithms. Collaboration has given each nation the knowledge needed to improve the detection of periscopes in sea clutter with modern high-